



Name: _____ Date : _____

IM 3 UNIT TEST V1 - Transformations & Quadratic Functions
Teacher: Mr. Santowski and Mr. Smith

Score: _____

PART 2 - CALCULATOR INACTIVE QUESTIONS

SHOW ALL WORK AND WRITE ALL ANSWERS IN THE SPACES PROVIDED.

Maximum marks will be given for correct answers. Where an answer is wrong, some marks may be given for correct method, provided the answer is supported by written working.

1. The graph of the parabolic function, $y = f(x)$ is shown. Use the graph to answer the following questions:

(12 marks)

- a. Write the equation of the axis of symmetry.

(1)

- b. Write the coordinates of the maximum point.

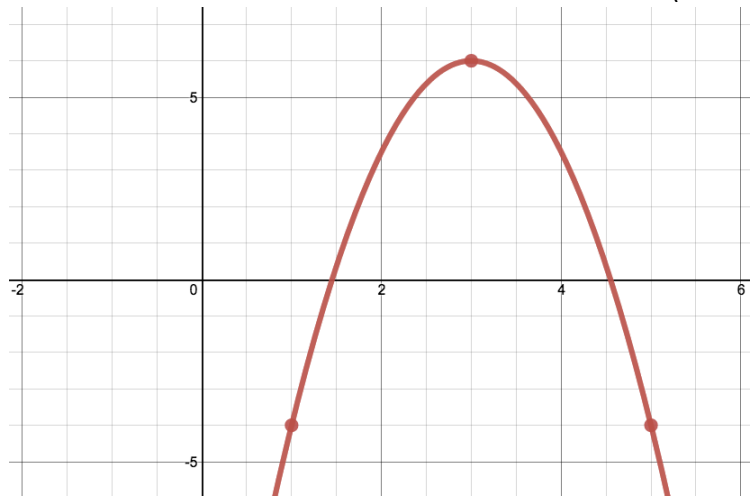
(1)

- c. Evaluate $f(5)$.

(1)

- d. Solve $f(x) = -4$.

(1)



- e. ~~Write the equation of the parabola in vertex form. Show/explain the key analysis that leads to your final solution.~~

(3)

- f. List the transformations that were applied to the parent function, $y = x^2$.

(3)

- g. Write the equation of the parabola in standard form.

(2)

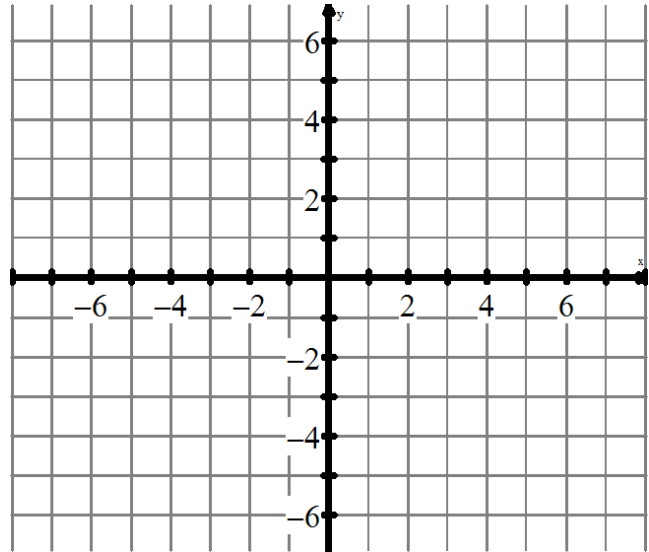
h. AP/HL: Sketch a graph of the function $y = 2 - |f(x)|$

2. In this question, you will work with the parent function, $f(x) = \frac{1}{x}$.

(14 marks)

- a. On the grid provided, graph the parent function of $f(x) = \frac{1}{x}$. Label the asymptotes. Show the 2 key points on this parent function.

(3)



- b. If $f(x) = \frac{1}{x}$, evaluate $f(3)$.

(1)

- c. Given the equation of $g(x) = \frac{2}{x-3} + 4$, list the transformations that you are going to make to $f(x) = \frac{1}{x}$.

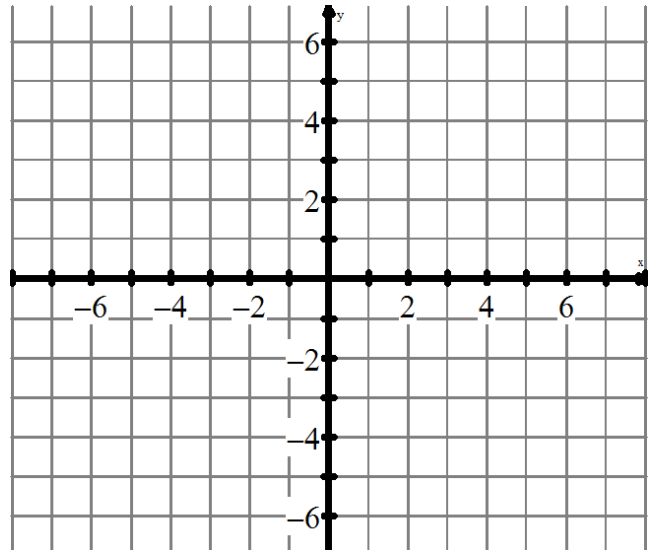
(3)

- d. Write the equations of asymptotes of the transformed function.

(2)

- e. Sketch the transformed function, given the details you've just worked in Q2c & Q2d.

(3)

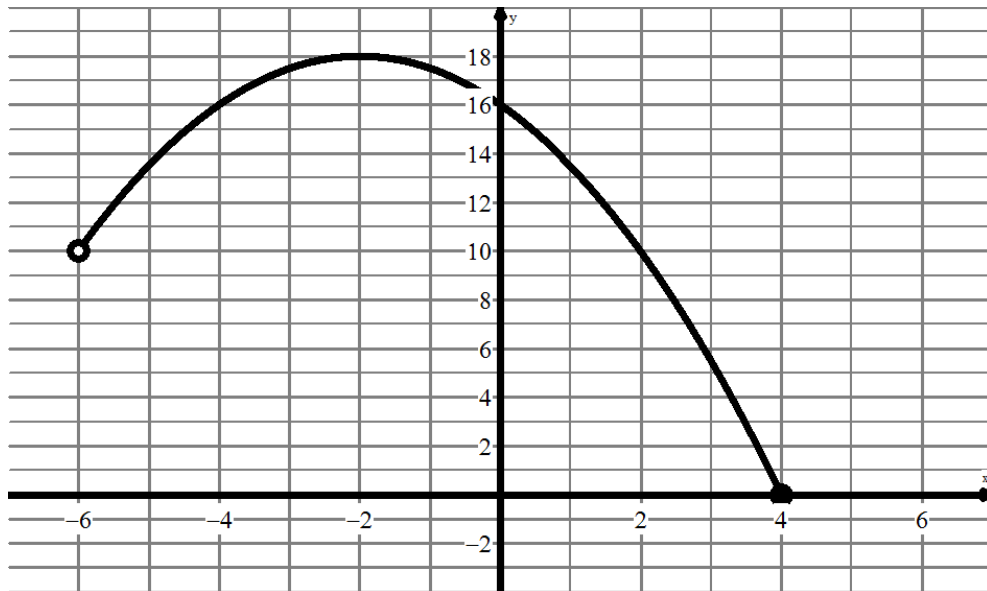


- f. Give the new coordinates of the original points (1,1) and (-1,-1)

(2)

3. You have been taught how to analyze the graphs of functions in IM3. Here is a graph showing part of a quadratic function. **Show the key steps of your algebraic working in order to earn FULL CREDIT for correct answers.**

(8 marks)



(a) Determine the value of $f(2)$

(1)

(b) Evaluate $f^{-1}(16)$

(1)

(c) State domain of $f(x)$

(1)

(d) State domain of $f^{-1}(x)$

(1)

(e) Where are/is the x-intercept(s) of the inverse of this function?

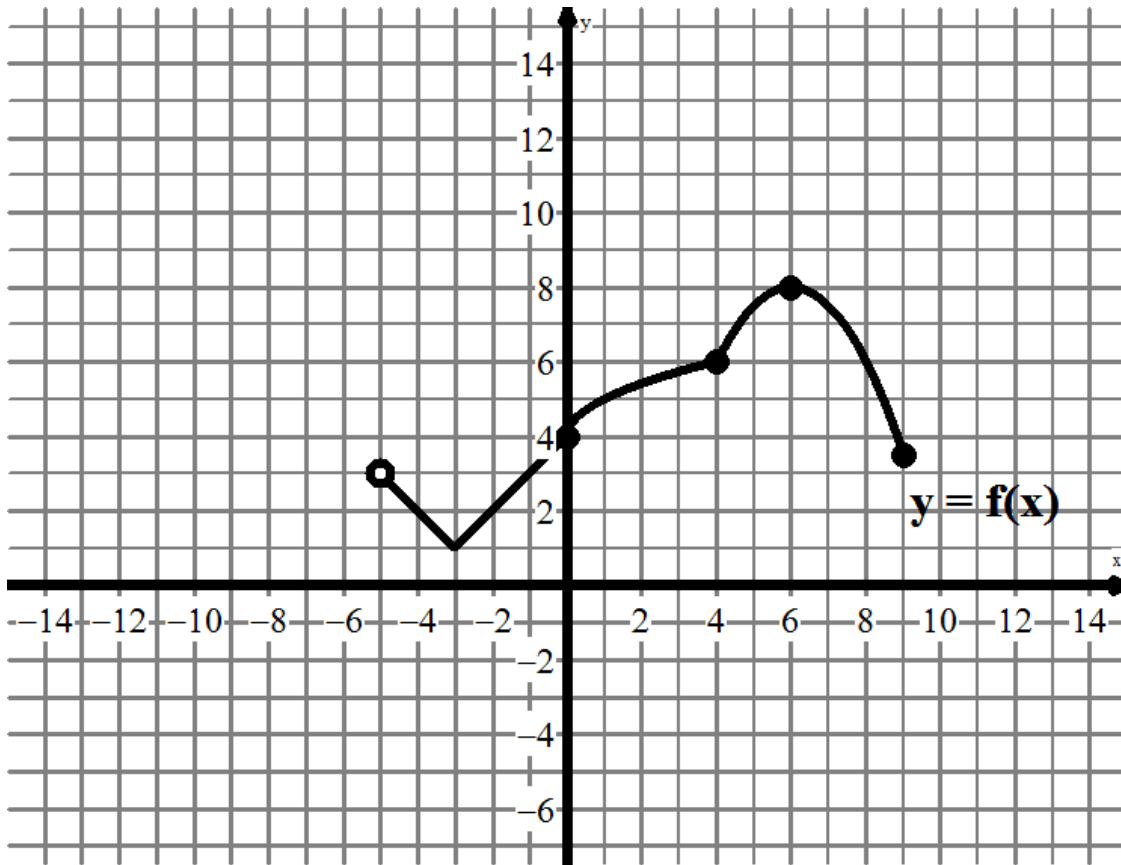
(1)

(f) Determine the equation of this quad fcn.

(3)

4. Here is a graph of the function, $y = f(x)$. You will be asked to make transformations of this function.

(10 marks)



(a) State the domain of $y = f(x)$

(1)

(b) State the range of $y = f(x)$

(1)

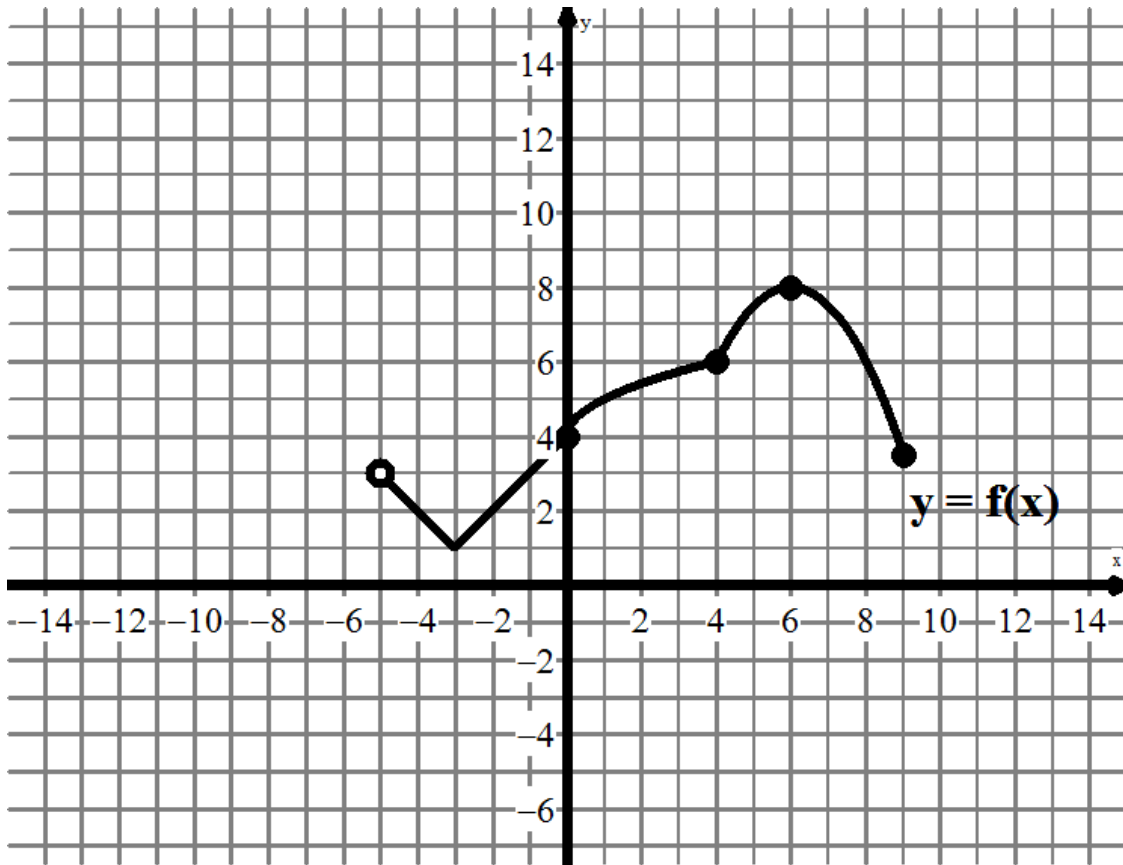
(c) Given the graph of $y = f(x)$, you will be asked to graph $y = 2f(x + 4) - 5$. To do this transformation, you have to move the point $(6, 8)$. Show calculations for how you transformed this key point.

(3)

(d) Graph the transformed function, $y = 2f(x + 4) - 5$.

(3)

5. CONTINUED: Here is a graph of the function, $y = f(x)$. You will be asked to graph the inverse of this function.
(8 marks)



- (a) Graph the inverse of this function, $y = f(x)$
(2)